

# Framing the evolution of spatial data infrastructures

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# Outline

- Framework
- Evolution Process
- Conclusions

# The framework

- The concepts based on information theory to formulate categories to differentiate the evolution of infrastructures.
  - Vertical Infrastructure
  - Horizontal Infrastructure

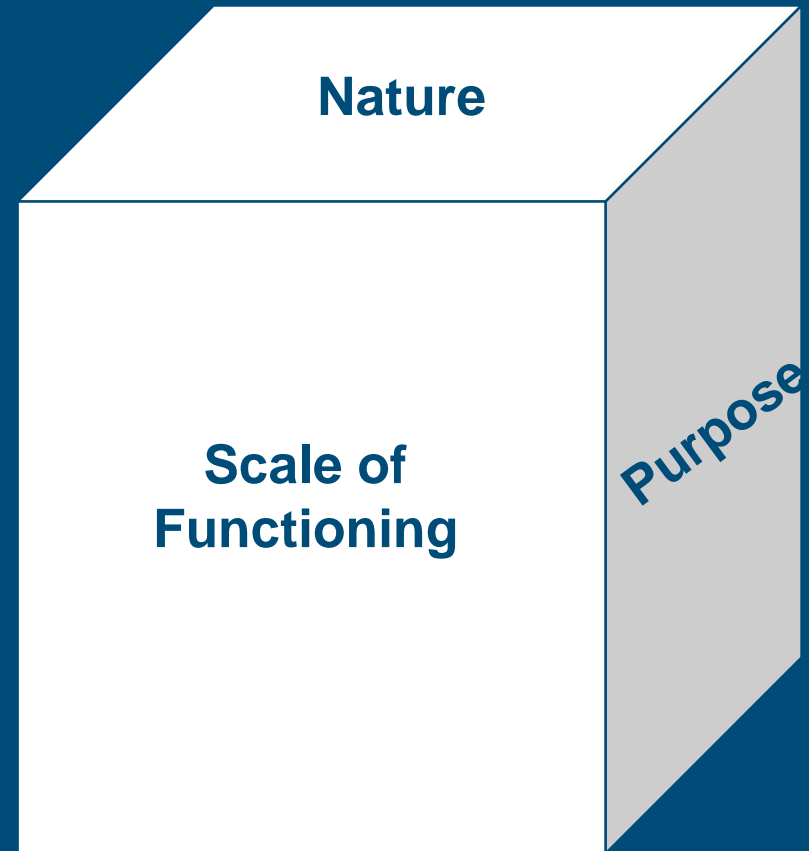
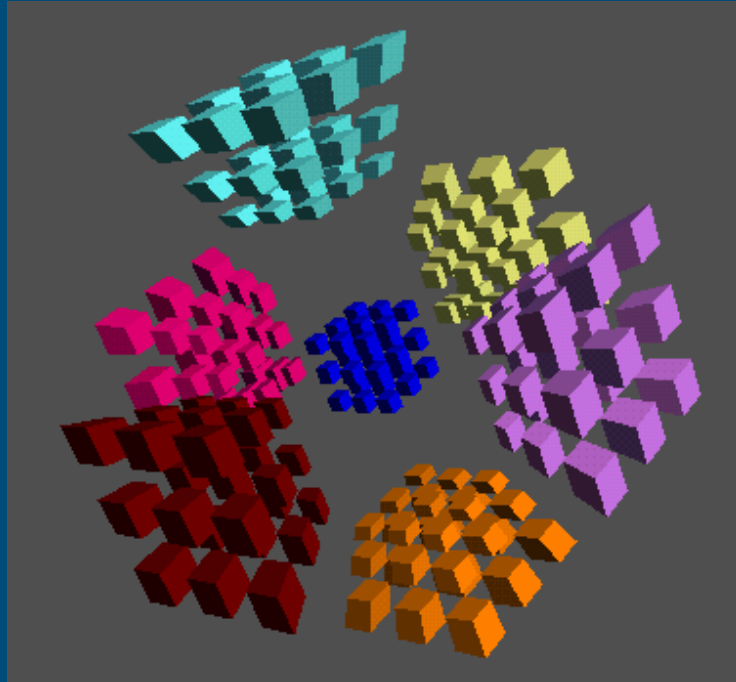
Hanseth and Lyytinen (2005)

# The framework

- A preliminary taxonomy to distinguish types of infrastructures according to
  - their different characteristics (nature),
  - scale of functioning,
  - their main purpose.

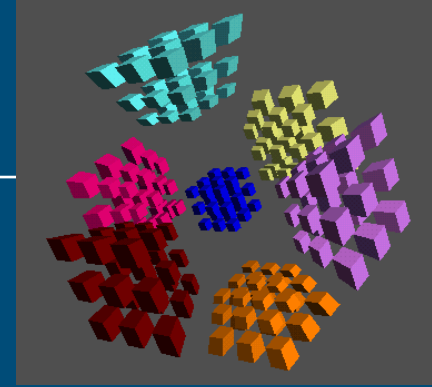
Tennenhouse *et al.* (1996)

# Three dimensional matrix approach



Doctor and Ankem (1998)

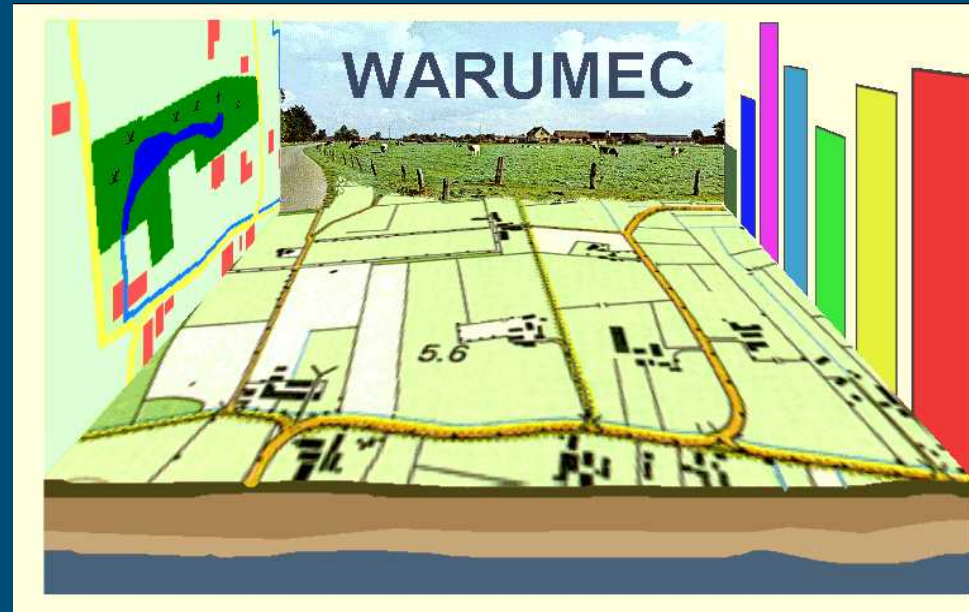
# Vertical Infrastructures



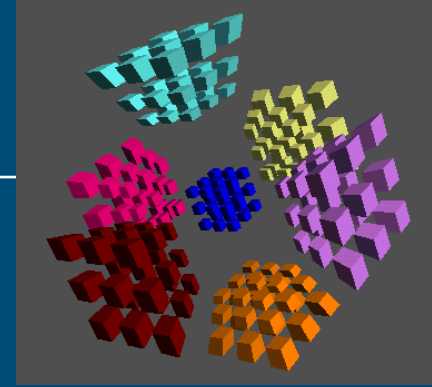
- Nature: short term services, intensive data production and sharing
- Scale of Functioning: single-sector
- Purpose: medium size of users groups, usually within a specific sector, different data sets for a specific application

# Spatial Decision Support Systems

- Started around 1990
- Data, processing and integration
- Users: decision makers
- Development and maintenance of applications are expensive
- Public sector



# Horizontal Infrastructures



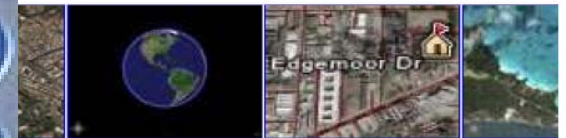
- Nature: medium and long term services, data including a referential on which value-adding content and long-term services can be built
- Scale of Functioning: multi-sectoral
- Purpose: large size of users groups, same data set for many applications

# Digital Earth

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# Overview of the evolution process

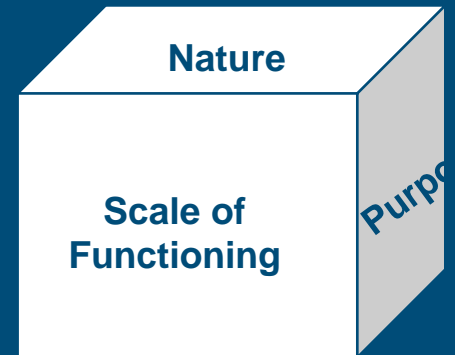
| HORIZONTAL  | VERTICAL   |
|---|--|
| Evolves by involving more users from different sectors                        | Evolves by supporting more users within a sector   |
| Evolves by providing updated data sets and improving the quality of data sets | Evolves by increasing the number of data sets available and improving the data redundancy    |
| Evolves by introducing generic services                                       | Evolves by adding specific services to complement the existing services of a specific sector |

# Conclusions

- The framework has been developed based on information theory concepts for describing the evolution process of spatial data infrastructures.

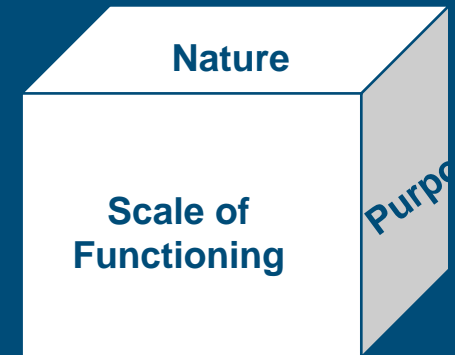
# Conclusions

- The framework integrates the three-dimensional matrix metaphor with the notion of horizontal and vertical layering of systems.



# Conclusions

- The framework also allows the integration of the three-dimensional matrix metaphor with the notions such as competitive versus monopolistic, generic versus specialised, and finally, decoupled versus bundled systems.



# Acknowledgements

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